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Resolving the genus *Phaeographina* Müll. Arg. in China

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Abstract

As part of ongoing studies of the lichen family Graphidaceae in China, the status of all taxa traditionally assigned to the genus *Phaeographina* reported from China is resolved in the present paper. Five new combinations are proposed: *Phaeographis pleiospora* (Zahlbr.) Z.F. Jia & Lücking, **comb. nov.**, *Platygramme elaeoplaca* (Zahlbr.) Z.F. Jia & Lücking, **comb. nov.**, *Platythecium maximum* (Groenh.) Z.F. Jia & Lücking, **comb. nov.**, *P. pyrrhochroa* (Mont. & Bosch) Z.F. Jia & Lücking, **comb. nov.**, and *Sarcographina heterospora* (Nyl.) Z.F. Jia & Lücking, **comb. nov.** Six new synonyms are established: *Phaeographina callospora* Zahlbr. [= *Diorygma hieroglyphicum* (Pers.) Staiger & Kalb], *P. fukiensis* Zahlbr. [= *Pallidogramme chrysenteron* (Mont.) Staiger, Kalb & Lücking], *P. fukiensis* var. *substriata* Zahlbr. [= *Pallidogramme chrysenteron* (Mont.) Staiger, Kalb & Lücking], *P. granulans* Zahlbr. [= *Platygramme platyloma* (Müll. Arg.) M. Nakan. & Kashiw.], *P. pluvisilvarum* Zahlbr. [= *Graphis alpestris* (Zahlbr.) Staiger], and *P. valida* Zahlbr. [= *Thecographa prosiliens* (Mont. & Bosch) A. Massal.]. Two additional synonyms are reported: *Phaeographina subrigida* (Nyl.) Zahlbr. is synonymized under *Platygramme platyloma* (Müll. Arg.) M. Nakan. & Kashiw., and *Platythecium dimorphodes* (Nyl.) Staiger under *Platythecium pyrrhochroum* (Mont. & Bosch) Z.F. Jia & Lücking.

Key words

Lichen, taxonomy, Graphidaceae, Ostropales

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Introduction

The lichen genus *Phaeographina* Müll. Arg. is an artificial, ascospore-based genus in *Graphidaceae* Dumort. (Müller 1882), in use until after the turn of the millenium. A revised generic concept in the family, based on Staiger (2002) and further elaborated using molecular phylogenetic approaches (Staiger et al. 2006; Rivas Plata et al. 2012, 2013; Lücking et al. 2013; Lumbsch et al. 2014), resulted in subsuming the name *Phaeographina* into synonymy with *Thecographa* A. Massal., with the single species, *Thecographa prosiliens* (Mont. & Bosch) A. Massal. (Lücking et al. 2007; Lücking and Rivas Plata 2008). Following this revised generic concept, most of the species at some point included in *Phaeographina,* representing a total of 265 names, have been redispositioned into other genera based on ascoma morphology and anatomy, such as *Pallidogramme* Staiger, Kalb & Lücking, *Phaeographis* Müll. Arg., *Platygramme* Fée, *Thecaria* Fée, and the aforementioned *Thecographa* (Staiger 2002; Archer 2006, 2009).

As part of a revision of Chinese *Graphidaceae*, we attempted to resolve the status of all species reported under the name *Phaeographina* from China (Wei 1991; Aptroot and Seaward 1999; Aptroot and Sipman 2001, Aptroot and Sparrius 2003). Twenty-one species were reported under the name *Phaeographina*, which are here presented in the form of an annotated checklist and listed under or transferred to the corresponding genera, namely *Chapsa* A. Massal., *Diorygma* Eschw., *Glyphis* Ach., *Graphis* Adans., *Pallidogramme*, *Phaeographis*, *Platygramme*, *Platythecium* Staiger, *Sarcographina* Müll. Arg., *Sarcographa* Fée, *Thecographa*, and *Thecaria*.

Materials and methods

Type specimens and other material investigated for this study are deposited in BRSL, H, HMAS-L, KUN, LCU-L, PC, TNS, UPS, and W. For several of the names included here that have already been treated by Kalb et al. (2004), Staiger (2002), and Lücking et al. (2009), we do not provide full synonymies and type specimen citations but give the corresponding reference. A dissecting microscope (Olympus SZX12) and a light microscope (Olympus BX51 and Nikon Eclipse-55i) were used for the morphological and anatomical studies. Measurements were taken from manual cross sections of fruit bodies in water. Amyloidity of the ascospores was tested using Lugol's solution. In cases where the chemistry of the type material had not been studied previously, lichen substances were identified by thin-layer chromatography (Culberson and Kristinsson 1970; Culberson and Kristinsson 1972; White and James 1985).

Taxonomy

Annotated checklist of Chinese species previously reported under the name *Phaeographina* Müll. Arg.

1. *Phaeographina callospora* Zahlbr.
Figure 1A–B

Feddes Repert. 31: 220, 1933. Type: Taiwan, *Faurie 118* (W, holotype!).
= ***Diorygma hieroglyphicum*** (Pers.) Staiger & Kalb, in Kalb et al., Symb. Bot. Upsal. 34(1): 151, 2004.

Based on the *Diorygma*-like thallus and ascomata, this taxon belongs in *Diorygma*. It has a clear hymenium, single-spored asci, hyaline, muriform ascospores 90–100 × 29–32 μm (Zahlbruckner 1933), and stictic acid. These characters, as well as the immersed lirellae with a split between excipulum and thalline margin, agree with *D. hieroglyphicum* (Pers.) Staiger & Kalb and hence, we propose this name as a synonym of the latter. The ascospores in this material are partially old and become brownish, which is the reason why it was described in *Phaeographina*. *Phaeographina callospora* Zahlbr. should not be confused with *Graphis collospora* Vain. [≡ *Graphina collospora* (Vain.) Zahlbr.], which is also a synonym of *D. hieroglyphicum* (Kalb et al. 2004). *Diorygma hieroglyphicum* is a corticolous species reported from Taiwan (type locality of *P. callospora*, Zahlbruckner 1933, 1940; Lamb 1963; Wang-Yang and Lai 1973 and 1976), Fujian, Hainan and Yunnan (Meng and Wei 2008; Wei et al. 2013; Jia and Wei 2016).

2. *Phaeographina chlorocarpoides* (Nyl.) Zahlbr.

Cat. Lich. Univers. 2: 435, 1923; *Hemithecium chlorocarpoides* (Nyl.) Staiger, Biblthca. Lichenol. 85: 283, 2002.
≡ ***Pallidogramme chlorocarpoides*** (Nyl.) Staiger, Kalb & Lücking in Lücking et al., Fieldiana, Bot. 38: 9, 2008.

Following Lücking et al. (2008), this taxon was transferred to the genus *Pallidogramme*. It is a corticolous species reported from Guangdong, Guangxi, Hunan, Hainan and Hong Kong (Krempelhuber 1873; Zahlbruckner 1930; Thrower 1988; Miao et al. 2007; Wei et al. 2013; Jia and Wei 2016).

3 .*Phaeographina chrysenteron* (Mont.) Müll. Arg.

Hedwigia 30: 52, 1891 [as 'chrysentera'].
≡ ***Pallidogramme chrysenteron*** (Mont.) Staiger, Kalb & Lücking in Lücking et al., Fieldiana, Bot. 38: 9, 2008; *Hemithecium chrysenteron* (Mont.) Trevis., Spighe Paglie: 13, 1853.

Following Lücking et al. (2008), this taxon belongs in *Pallidogramme*. It is a corticolous species reported from Fujian, Guangdong, Guangxi, Yunnan, Hunan, Hainan and

Figure 1. A–B *Phaeographina callospora* Zahlbr. (*Faurie 118*) **C–D** *Phaeographina elaeoplaca* Zahlbr. (*Chung 596d*). Scale bars: 1mm.

Taiwan (Zahlbruckner 1930, 1932; Miao et al. 2007; Wei et al. 2013; Jia and Wei 2016; Aptroot and Sparrius 2003).

Pallidogramme is listed as invalid name in *Index Fungorum* (accessed 18 January 2017), presumably based on ICN Art. 41.5 (incomplete citation of the replaced synonym). However, the replaced synonym is not *Hemithecium* subgen. *Leucogramma* Staiger (Staiger 2002: 277), but *Leucogramma* A. Massal. (1860: 273, 320), an illegitimate later homonym of *Leucogramma* Meyer (1825: 331). Both *Leucogramma* A. Massal. and its type species, *L. chrysenteron* (Mont.) A. Massal. were established on the same page (1860: 320), and since in the protologue of *Pallidogramme* the full reference is given for the type species (designated as holotype), *L. chrysenteron* (Mont.) A. Massal., this fulfills the requirements of ICN Art. 41 for valid publication of the genus name.

4. *Phaeographina elaeoplaca* Zahlbr.

Figure 1C–D

Ann. Mycol. 30: 431, 1932. Type: Fujian: *Chung 596 d* (W, lectotype!, annotation label by Nakanishi in 1973).

≡ ***Platygramme elaeoplaca*** (Zahlbr.) Z.F. Jia & Lücking, **comb. nov.** (see below).

This material is characterized by lirellae with thick, apically carbonized, exposed labia and a closed disc, an inspersed hymenium, single-spored asci producing brown ascospores about 80–110 × 20–30 µm, and the absence of secondary substances. Ascoma morphology and the brown ascospores place this material in the genus *Platygramme*. Several species have been described which belong in *Platygramme* and agree with *Phaeographina elaeoplaca* in ascoma morphology (thick labia with closed disc, single-spored asci, absence of secondary substances: *Graphis commutabilis* Kremp. (Krempelhuber 1875) [≡ *Platygramme commutabilis* (Kremp.) A. W. Archer] has ascomata with whitish thalline cover and ascospores 80–110 µm long; *Phaeographina platyloma* Müll. Arg. (Müller 1882) [≡ *Platygramme platyloma* (Müll. Arg.) M. Nakan. & Kashiw.; syn.: *Platygramme impudica* (A. W. Archer) A. W. Archer] has ascomata with distinct, lateral thalline cover and ascospores 120–180 µm long; and *Graphis subrigida* Nyl. (Nylander & Crombie, 1883) [≡ *Phaeographina subrigida* (Nyl.) Zahlbr.] has ascomata with exposed labia and ascospores 110–150 µm long. On the annotation label of the lectotype of *Phaeographina elaeoplaca*, Nakanishi noted that this name should be a synonym of *Ph. subrigida*; however, the ascospores of the latter are much longer. Archer (2009) described *Platygramme commutabilis*, which agrees with *Phaeographina elaeocarpa* in ascospore size, as having exposed labia, which would make *Ph. elaeocarpa* a synonym of *Pl. commutabilis*. However, this observation is in conflict with the type of *Pl. commutabilis*, which clearly shows the labia covered by a whitish thallus layer. Thus, we conclude that *Ph. elaeocarpa* is neither conspecific with *Ph. subrigida* nor with *Pl. commutabilis* but represents a distinct taxon, recombined below as *Platygramme elaeoplaca* (Zahlbr.) Z.F. Jia & Lücking. We suspect that the Australian material identified by Archer (2009) as *Pl. commutabilis* in reality represents *Pl. elaeocarpa*. Based on ascospore size, *Ph. subrigida* is to be placed as an additional synonym under *Pl. platyloma*.

Platygramme elaeocarpa is a corticolous species reported from Fujian (type locality; Zahlbruckner 1932, 1934, 1940).

5. *Phaeographina fukiensis* Zahlbr.

Figure 2A–B

in Handel-Mazzetti, Symb. Sin. 3: 62, 1930. Type: Fujian, *Chung 399a* (W, holotype!).
= ***Pallidogramme chrysenteron*** (Mont.) Staiger, Kalb & Lücking, in Lücking et al., Fieldiana, Bot. 38: 9, 2008.

Due to the characteristics of thallus and ascomata, this taxon belongs in *Pallidogramme*. According to the annotation label by Nakanishi, it is similar to *Pallidogramme chlorocarpoides* (Nyl.) Staiger, Kalb & Lücking, but differs by having smaller ascospores (36–48 × 12–16 µm, Zahlbruckner 1930) than the latter (*P. chlorocarpoides*: 55–110 × 20–39 µm, Staiger 2002). It therefore agrees perfectly with *P. chrysenteron* (ascospores 33–60 × 10–15 µm, Staiger 2002) and represents another synonym of the latter. The distribution of this species in China is treated above.

Figure 2. A–B *Phaeographina fukiensis* Zahlbr. (*Chung 399a*) **C–D** *Graphis glyphiza* Nyl. (*Nylander 6989*). Scale bars = 1mm.

Phaeographina fukiensis var. *substriata* Zahlbr.

Ann. Mycol. 30: 432, 1932. Type: Fujian: *Chung 597* (W, holotype!).
= ***Pallidogramme chrysenteron*** (Mont.) Staiger, Kalb & Lücking, in Lücking et al., Fieldiana, Bot. 38: 9, 2008.

According to Zahlbruckner, this taxon differs from the nominal variety by its striate labia and smaller ascospores, which is odd considering that the type of the nominal variety has distinctly striate labia. The ascospores fall within the lower range of variation of *Pallidogramme chrysenteron* and hence this is considered another synonym of that species.

6. *Phaeographina glyphiza* (Nyl.) Zahlbr

Figure 2, C–D

in Handel-Mazzetti, Symb. Sinic. 3: 62, 1930.

≡ ***Sarcographa glyphiza*** (Nyl.) Kr.R. Singh & G.P. Sinha, Indian Lichens, An Annotated Checklist (Kolkata): 404, 2010; *Graphis glyphiza* Nyl., Ann. Sci. Nat., Bot., sér. 4, 19: 374, 1863; *Phaeographis glyphiza* (Nyl.) Zahlbr., Cat. Lich. Univers. 2: 373, 1923. Type: China, Hong Kong, *Nylander 6989* (H, lectotype!).

Following Singh and Sinha (2010), this taxon belongs in *Sarcographa* as *S. glyphiza* (Nyl.) Kr.R. Singh & G.P. Sinha. It is a corticolous species reported from Hong Kong (type location; Nylander 1863, Leighton 1869, Hue 1891 as *Graphis glyphiza*; Zahlbruckner 1923 as *Phaeographis glyphiza*; Zahlbruckner 1930, 1932, Aptroot 1999 as *Phaeographina glyphiza*). Seaward and Aptroot (2005) reported this taxon with the current name *Sarcographa glyphiza* from Hong Kong.

7. *Phaeographina granulans* Zahlbr.
Figure 3, A–B

Ann. Mycol. 30: 432, 1932. Type: Fujian, *Chung 404* (W, holotype!)
= ***Platygramme platyloma*** (Müll. Arg.) M. Nakan. & Kashiw., in Nakanishi, Kashiwadani & Moon, Bull. Natn. Sci. Mus., Tokyo, B 29(2): 89, 2003.

Based on the characteristics of the ascomata, excipulum and ascospores, which are about 140–160 µm long, this taxon is a further synonym of *Platygramme platyloma* (Müll. Arg.) M. Nakan. & Kashiw. (see discussion under *Pl. elaeocarpa* above), as already annotated by Nakanishi on the holotype. *Platygramme platyloma* is a corticolous species reported from Fujian (Type locality of *Phaeographina granulans*, Zahlbruckner 1932, 1934, 1940; Lamb 1963; Jia and Kalb 2013).

8. *Phaeographina heterospora* (Nyl.) Zahlbr.

Cat. Lich. Univers. 2: 439, 1923; *Gymnographa heterospora* (Nyl.) Staiger. Biblthca Lichenol. 85: 271, 2002. Type: Reunion, *Lepervanche-Mézières 43* (H-NYL 7815, holotype!).
≡ ***Sarcographina heterospora*** (Nyl.) Z.F. Jia & Lücking, **comb. nov.** (see below)

Staiger (2002), placed this taxon in *Gymnographa* as *G. heterospora* (Nyl.) Staiger. Restudy of the type material confirmed that this taxon is very closely related to *Sarcographina cyclospora* Müll. Arg., which was recently shown to belong in tribe *Ocellularieae* within *Graphidaceae* (Kraichak et al. 2014). Hence, *Phaeographina heterospora* is here also recombined in that genus, as *Sarcographina heterospora* (Nyl.) Z.F. Jia & Lücking. *Sarcographina heterospora* is a corticolous species reported from Taiwan (Aptroot and Sparrius 2003).

Figure 3. A–B *Phaeographina granulans* Zahlbr. (*Chung 404*) **C–D** *Phaeographina lecanographa* var. *pleiospora* Zahlbr. (*Chung 596b*). Scale bars = 1mm.

9. *Phaeographina lecanographa* var. *pleiospora* Zahlbr.

Figure 3C–D

in Handel-Mazzetti, Symb. Sin. 3: 61, 1930. Type: China. Fujian, *Chung 596b* (W, holotype!).

≡ ***Phaeographis pleiospora*** (Zahlbr.) Z.F. Jia & Lücking, **comb. nov.** (see below).

This material belongs in a difficult group of taxa characterized by rounded to shortly elongate, erumpent to prominent ascomata with a usually fissured, thalline margin partially exposing the (dark) brown disc, and with muriform ascospores. Staiger (2002) distinguished two species in this group, viz. *Phaeographis kalbii* Staiger, with norstictic acid, 1–4-spored asci, and ascospores 95–125 × 20–30 µm, and *Ph. lecanographa* (Nyl.) Staiger, with virensic acid, 1–4-spored asci, and ascospores 85–150 × 25–50 µm. Lücking (2015) later found an earlier name for the latter species with virensic acid, viz. *Thelotrema spondaicum* Nyl., now *Phaeographis spondaica* (Nyl.) Lücking. *Phaeographis kalbii* was synonymized with *Ph. atromaculata* (A.W. Archer) A.W. Archer (Archer 2006), but Lendemer and Harris (2014) proposed to keep the two species separate and added a further species to this group, *Ph. oricola* Lendemer & R.C. Harris, which dif-

fers mainly in its single-spored asci. The type material of *Ph. lecanographa* var. *pleiospora* contains norstictic acid (as already noticed by Zahlbruckner) and would belong in that latter complex, but the ascospores are consistently smaller (60–80 × 20–30 µm). We therefore accept this as a distinct species, *Ph. pleiospora* (Zahlbr.) Z.F. Jia & Lücking. It is a corticolous species reported from Fujian (Type locality. Zahlbruckner 1930, 1933, 1934 and 1940).

10. *Phaeographina macrospora* (Zahlbr.) Nakanishi

J. Sci. Hiroshima Univ., Ser. B, div. 2, 11: 101, 1966; *Phaeographina montagnei* f. *macrospora* Zahlbr., in Fedde, Repertorium 31: 219, 1933. Type: China. Taiwan, *Asahina 372* (TNS, holotype).
= ***Thecaria montagnei*** (Bosch) Staiger, Biblthca Lichenol. 85: 446, 2002.

Following Aptroot (2004), this taxon is a synonym of *Thecaria montagnei* (Bosch) Staiger. *Thecaria montagnei* is a corticolous species reported from Taiwan (Type locality of *Phaeographina macrospora*, Zahlbruckner 1933; Wang-Yang and Lai 1973) and Hainan (Wei et al. 2013).

11. *Phaeographina maxima* Groenh.

in Blumea, Suppl. 5 (H. J. Lam Jubilee Vol.). 107, 1958. Type: Indonesia, Sumatra, *Groenhart 9453* (BO, holotype, not seen, but original image in protologue seen).
≡ ***Platythecium maximum*** (Groenh.) Z.F. Jia & Lücking, **comb. nov.** (see below).

According to the original description and excellent illustrations, this is a species of *Platythecium*, agreeing with *P. serpentinellum* (Nyl.) Staiger in the brown ascospores and with *P. allosporellum* (Nyl.) Staiger in the carbonized hypothecium. Groenhart (1958) beautifully illustrates the enormous extension of the thallus of the specimen in the field, with over 100 cm covering a large boulder. This is consistent with our observations that *Platythecium* species often form large thalli on rocks near streams. Since the type material is different from any known in the genus, it is here recombined as separate species, *Platythecium maximum* (Groenh.) Z.F. Jia & Lücking. It is a saxicolous species, within China reported from Hong Kong (Thrower 1988).

12. *Phaeographina micromma* Zahlbr.

Figure 4A–B

Feddes Repert. 31: 219, 1933. Type: China. Taiwan, *Asahina 376* (W, holotype!).
≡ ***Fissurina micromma*** (Zahlbr.) Aptroot, Symb. Bot. Upsal. 34 (1): 34, 2004.

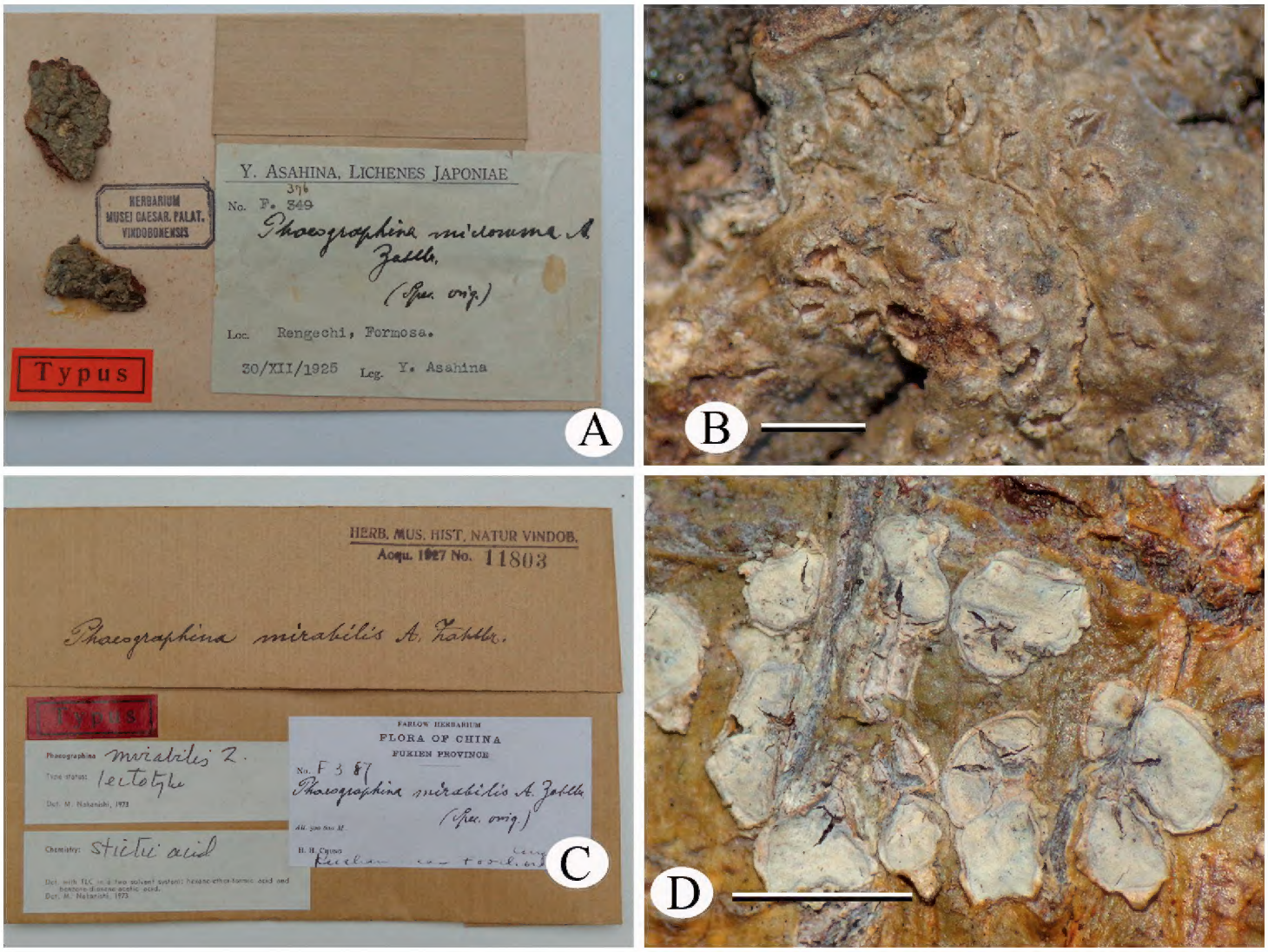

Figure 4. A–B *Phaeographina micromma* Zahlbr. (*Asahina 376*) **C–D** *Phaeographina mirabilis* Zahlbr. (*Chung 387*). Scale bars = 1mm.

Following Aptroot (2004), this taxon is to be treated in the genus *Fissurina*, as *F. micromma* (Zahlbr.) Aptroot. It is a corticolous species reported from Taiwan (Type locality, Zahlbruckner 1933, 1940; Lamb 1963; Wang-Yang and Lai 1973).

13. *Phaeographina mirabilis* Zahlbr.

Figure 4C–D

in Handel-Mazzetti, Symb. Sinic. 3: 62, 1930. Type: China. Fujian, *Chung 387* (W, holotype!).

≡ ***Chapsa mirabilis*** (Zahlbr.) Lücking, in Rivas Plata, Lücking, Sipman, Mangold, Kalb & Lumbsch, Lichenologist 42(2): 183, 2010.

Following Rivas Plata et al. (2010), this taxon is currently accepted in *Chapsa*, as *C. mirabilis* (Zahlbr.) Lücking. It is a corticolous species reported from Fujian (Type locality, Zahlbruckner 1930, 1932).

14. *Phaeographina montagnei* (Bosch) Müll. Arg.

Flora 65: 399, 1882.
≡ ***Thecaria montagnei*** (Bosch) Staiger, Biblthca Lichenol. 85: 446, 2002.

Following Staiger (2002), this taxon is to be treated in *Thecaria* as *T. montagnei* (Bosch) Staiger. The distribution of this species is treated above.

15. *Phaeographina obfirmata* (Nyl.) Zahlbr.
Figure 5A–B

Cat. Lich. Univers. 2: 441, 1923; *Lecanactis obfirmata* Nyl., J. Linn. Soc., Bot. 20: 65, 1883. Type: China, Shanghai, *Maingay 1861* (H-NYL 7997, holotype!).
= ***Glyphis scyphulifera*** (Ach.) Staiger, Biblthca Lichenol. 85: 175, 2002.

Following Staiger (2002), this taxon is a synonym of *Glyphis scyphulifera* (Ach.) Staiger. The latter is a corticolous species reported from Shanghai (Type locality, Nylander and Crombie 1883; Nylander 1891; Hue 1891; Zahlbruckner 1924, 1930) and Hong Kong (Thrower 1988).

16. *Phaeographina pluvisilvarum* Zahlbr.
Figure 5C–D

in Handel-Mazzetti, Symb. Sinic. 3: 60, 1930. Type: Chian. Yunnan, *Handel-Mazzetti 9261* (W, holotype!).
= ***Graphis alpestris*** (Zahlbr.) Staiger, Biblthca Lichenol. 85: 205, 2002.

This taxon was suggested to represent a synonym of *Graphis alpestris* by Nakanishi on an annotation label. Zahlbruckner (1930) gives the ascospores as 135–165 × 30–33 µm, somewhat larger than reported for *G. alpestris* (70–115 × 19–30 µm). Unfortunately, the remaining material has only empty lirellae, so this information cannot be checked. We therefore follow Nakanishi in treating this name as a synonym of *Graphis alpestris* (Zahlbr.) Staiger. It is a corticolous species reported from Yunnan (Type locality of *Phaeographina pluvisilvarum*, Zahlbruckner 1930, 1932).

17. *Phaeographina prosiliens* (Mont. & Bosch) Müll. Arg.

Flora 65: 398, 1882.
≡ ***Thecographa prosiliens*** (Mont. & Bosch) A. Massal., Atti Inst. Veneto Sci. Lett., ed Arti, Sér. 3, 5: 316, 1860.

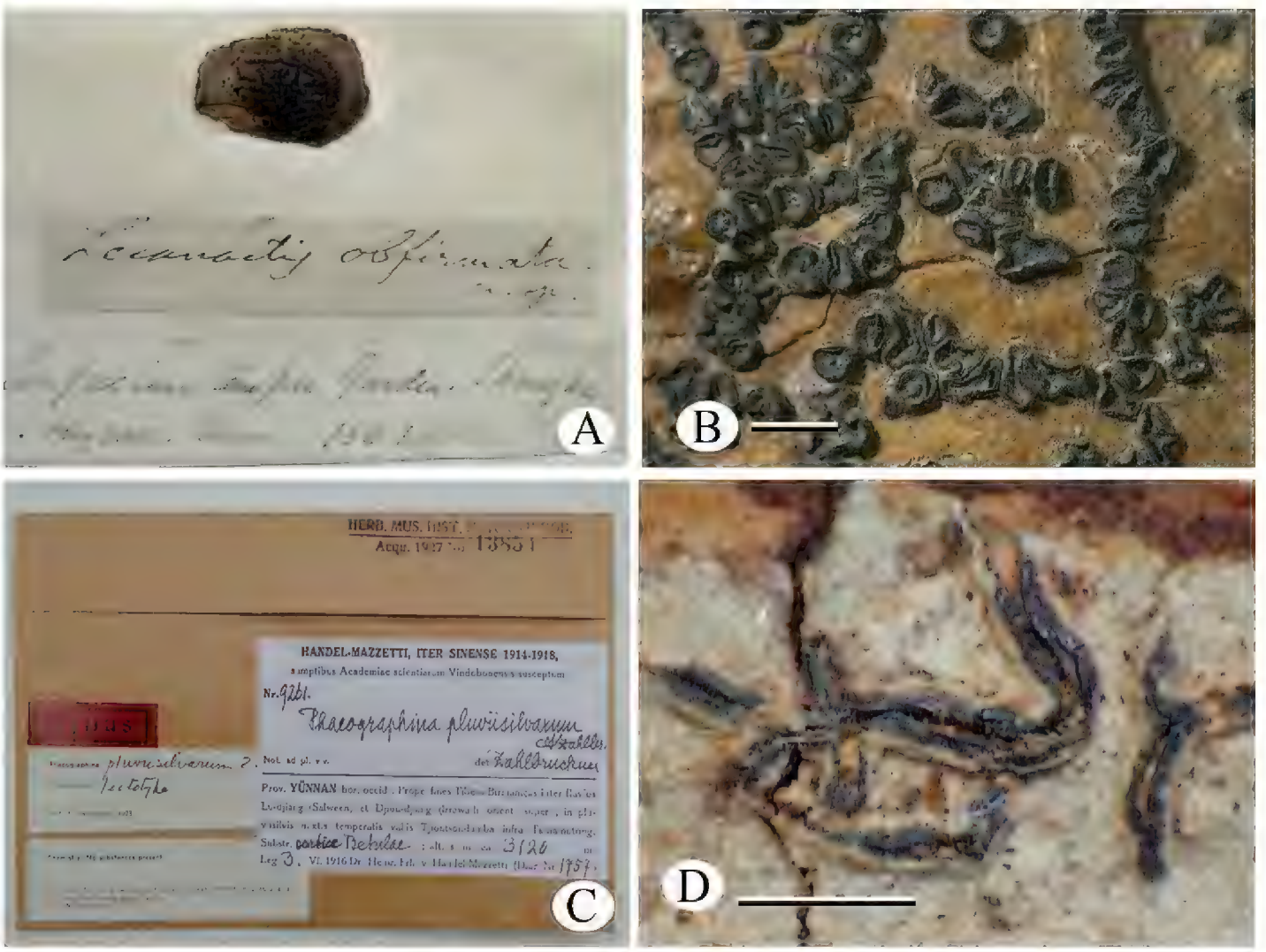

Figure 5. A–B *Phaeographina obfirmata* (Nyl.) Zahlbr. (*Maingay 1861*) **C–D** *Phaeographina pluvisilvarum* Zahlbr. (*Handel-Mazzetti 9261*). Scale bars = 1mm.

Following Lücking et al. (2007), this taxon was retransferred to *Thecographa* as *T. prosiliens* (Mont. & Bosch) A. Massal. The species is a corticolous species reported from Taiwan (Aptroot and Sparrius 2003 as *Phaeographina prosiliens*; Zahlbruckner 1933, 1940; Lamb 1963; Wang-Yang and Lai 1973 as *Phaeographina valida* Zahlbr. another synonym seen below).

18. *Phaeographina pyrrhochroa* (Mont. et Bosch) Zahlbr.

Figure 6A–B

Cat. Lich. Univers. 8: 218, 1928; *Ustalia pyrrhochroa* Mont. et Bosch, in Montagne, Syll. Gen. sp. Crypt. (Paris): 352, 1856. Type: Indonesia, Java, *Junghuhn s.n.* (PC, holotype!).

≡ ***Platythecium pyrrhochroum*** (Mont. & Bosch) Z.F. Jia & Lücking, comb. nov. (= *Platythecium dimorphodes* (Nyl.) Staiger).

According to the lectotype in PC which we studied, this name is synonymous with *Platythecium dimorphodes* (Nyl.) Staiger and unfortunately provides an earlier epithet for it. Since the latter name has only been introduced recently and has been used few times afterwards, a conservation proposal seems not in order and we propose the new

Figure 6. A–B *Ustalia pyrrhochroa* Mont. et Bosch (*Junghuhn s.n.*) **C–D** *Phaeographina valida* Zahlbr. (*Asahina 355*). Scale bars = 1mm.

combination *Platythecium pyrrhochroum* (Mont. & Bosch) Z.F. Jia & Lücking, with *P. dimorphodes* (Nyl.) Staiger as synonym. Redinger (1935) and Nakanishi (1966) had a different concept of *Phaeographina pyrrhochroa*, referring to a species with prominent lirellae with closed labia and large ascospores, which would correspond to what is now known as *Pallidogramme chrysenteron*. Nakanishi discovered this error when he studied the type in 1973, but this has apparently never been published. *Platythecium dimorphodes* is a corticolous species reported from Hong Kong (Aptroot and Seaward 1999) and Taiwan (Zahlbruckner 1933; Wang-Yang and Lai 1973).

19. *Phaeographina quassiicola* (Fée) Müll. Arg.

Mém. Soc. Phys. Hist. Nat. Genève 29(8): 47, 1887[as 'quassiaecola'].

≡ ***Thecaria quassiicola*** Fée, Essai Crypt. Exot. (Paris): xcii, tab. 1, fig. 16 (1825) [1824][as '*quassiaecola*'].

Staiger (2002) retransferred this taxon to *Thecaria* as *T. quassiicola* Fée. It is a corticolous species reported from Zhejiang (Xu 1989), Fujian (Zahlbruckner 1930), Hainan

(Wei et al. 2013), Taiwan (Zahlbruckner 1933; Wang-Yang and Lai 1973) and Hong Kong (Thrower 1988; Aptroot and Seaward 1999, Aptroot and Sipman 2001).

20. *Phaeographina scalpturata* (Ach.) Müll. Arg.
Flora 65 (25): 399, 1882.

≡ ***Phaeographis scalpturata*** (Ach.) Staiger, Biblthca Lichenol. 85: 345, 2002.

Following Staiger (2002), this taxon was transferred to *Phaeographis* as *P. scalpturata* (Ach.) Staiger. It is a corticolous species reported from Hong Kong (Aptroot and Seaward 1999; Aptroot and Sipman 2001) and Taiwan (Aptroot and Sparrius 2003).

21. *Phaeographina valida* Zahlbr.
Figure 6C–D

Feddes Repert. 31: 217, 1933. Type: China. Taiwan, *Asahina 355* (W, lectotype!).
= ***Thecographa prosliens*** (Mont. & Bosch) A. Massal., Atti Inst. Veneto Sci. lett., ed Arti, Sér. 3, 5: 316, 1860.

Based on the characteristics of the lirellae, excipulum and ascospores, this taxon belongs in *Thecographa*. It has muriform ascospores, 140–160 × 20–28 µm in size, hence we treat it as a synonym of *Thecographa prosiliens* (Mont. & Bosch) A. Massal. The distribution of this species is referred above.

Nomenclatural novelties

***Phaeographis pleiospora* (Zahlbr.) Z.F. Jia & Lücking, comb. nov.**
MycoBank: MB820372

Bas.: *Phaeographina lecanographa* var. *pleiospora* Zahlbr., in Handel-Mazzetti, Symb. Sin. 3: 61, 1930. Type: China. Fujian, *Chung 596b* (W, holotype!).

Description. Thallus corticolous, crustose, surface pale grey to yellowish-grey, smooth to slightly rough; apothecia rounded to shortly elongate, erumpent to prominent, usually fissured, single, rarely branched, 1–3 mm long and 0.5–2 mm wide; thalline margin partially exposing the (dark) brown disc; labia inconspicuous; discs opened, brown; proper exciple laterally carbonized; hymenium inspersed; 2-4 ascospores per ascus, brown, ellipsoid to subovate, muriform, 60–80 × 20–30 µm, I–.

Chemistry. Norstictic acid.

Notes. This species is distinguished from *Phaeographis lecanographa* by the smaller ascospores (60–80 × 20–30 µm *vs.* 85–150 × 25–50 µm).

***Platygramme elaeoplaca* (Zahlbr.) Z.F. Jia & Lücking, comb. nov.**
MycoBank: MB820376

Bas.: *Phaeographina elaeoplaca* Zahlbr., Ann. Mycol. 30: 431, 1932. Type: Fujian: *Chung 596 d* (W, lectotype!, fide Nakanish on annotation label 1973).

Description. Thallus corticolous, crustose, surface yellowish-grey, somewhat greenish, waxy, flat to slightly rough; apothecia lirelliform, sessile, black, elongate, single, not branched, 1–5 mm long and 0.2–0.4 mm wide; labia entire, exposed; discs closed, or slightly opened; proper exciple apically carbonized, thick; hymenium inspersed; 1 ascospore per ascus, brown, elongate-ellipsoid, densely muriform, 80–110 × 20–30 µm, I+ red-brown.

Chemistry. No lichen compounds detected.

Notes. This species is similar to *Platygramme commutabilis*, but the latter differs in having ascomata covered with a whitish thallus layer. *Platygramme platyloma* has a distinct, lateral thalline margin covering the ascomata, as well as larger ascospores (see above).

***Platythecium maximum* (Groenh.) Z.F. Jia & Lücking, comb. nov.**
MycoBank: MB820377

Bas.: *Phaeographina maxima* Groenh., in Blumea, Suppl. 5 (H. J. Lam Jubilee Vol.). 107, 1958. Type: Indonesia, Sumatra, *Groenhart 9453* (BO, holotype, not seen, but original image in protologue seen).

Description. Thallus saxicolous, crustose, surface grey, smooth; apothecia lirelline, elongate, subimmersed, single and branched, 1–20 mm long and 0.2–0.3 mm wide, with lateral thalline margin; labia conspicuous; discs open, dark; proper exciple completely carbonized; hymenium clear; 8 ascospores per ascus, brown, ellipsoid, muriform, 4/1–2-locular, 14–16 × 8–9 µm, I–.

Chemistry. Not tested.

Notes. This species is similar to *Platythecium serpentinellum* (Nyl.) Staiger in the brown ascospores and to *P. allosporellum* (Nyl.) Staiger in the carbonized hypothecium. The type material is different from any known species in the genus, it is here recombined as a separate species.

***Platythecium pyrrhochroum* (Mont. & Bosch) Z.F. Jia & Lücking, comb. nov.**
MycoBank: MB820382

Bas.: *Phaeographina pyrrhochroa* (Mont. et Bosch) Zahlbr., Cat. Lich. Univers. 8: 218, 1928; *Ustalia pyrrhochroa* Mont. et Bosch, in Montagne, Syll. Gen. sp. Crypt. (Paris): 352, 1856. Type: Indonesia, Java, *Junghuhn s.n.* (PC, holotype!).

= *Platythecium dimorphodes* (Nyl.) Staiger, Biblthca Lichenol. 85: 383, 2002; *Graphis dimorphodes* Nyl., Trans. Linn. Soc. London 27: 176, 1869. Type: Sri Lanka, *Thwaites C. 23* (H-NYL 7812, holotype!).

Description. Thallus corticolous, crustose, surface whitish to yellowish, smooth to minutely roughened; apothecia lirelliform, sessile, elongate, single to branched, 1–5 mm long and 0.3–0.4 mm wide; labia inconspicuously striate, thalline margin whitish, concolorous with the thallus; discs closed, or slit-like; proper exciple uncarbonized, pale-brownish; hymenium clear; 2–4 ascospores per ascus, brownish, oblong, densely muriform, 28–60 × 10–17 µm.

Chemistry. Norstictic acid.

Notes. As stated above, this name is synonymous with *Platythecium dimorphodes* (Nyl.) Staiger and unfortunately provides an earlier epithet for it.

Sarcographina heterospora **(Nyl.) Z.F. Jia & Lücking, comb. nov.**
MycoBank: MB820385

Bas.: *Graphis heterospora* Nyl., Ann. Sci. Nat. Bot. sér. 4, 11: 261, 1859; *Phaeographina heterospora* (Nyl.) Zahlbr., Cat. Lich. Univers. 2: 439, 1923; *Gymnographa heterospora* (Nyl.) Staiger. Biblthca Lichenol. 85: 271, 2002. Type: Reunion, *Lepervanche-Mézières 43* (H-NYL 7815, holotype!).

Description. Thallus corticolous, crustose, surface yellowish to pale grey, flat to slightly rough; apothecia lirelline, immersed in stromata; stromata white, irregularly circular, 0.1–1 mm wide; lirellae thin, black, immersed, in irregular, stellate cluster, 0.05–1 mm wide; discs black, closed; proper exciple uncarbonized, pale yellow brown; hymenium clear; 8 ascospores per ascus, brown, rounded ellipsoid, irregularly 4/1, 2/2 or 3/1 –2 locular, 10–13 × 6–8 µm, I+ red-brown.

Chemistry. Psoromic acid and conpsoromic acid.

Notes. This species is very similar to *Sarcographina cyclospora* Müll. Arg., but the latter differs in having a brownish to apically carbonized excipulum.

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